

PHOTONICS PROTOTYPING FACILITY (PPF) CHARTER

1. Overview

The principal function of the Photonics Prototyping Facility (PPF) is to assist in bridging the photonics “innovation chasm” that is currently recognised as a barrier for successful technology transfer and commercialisation. This is achieved by providing an environment (infrastructure, equipment, expertise and access to business and technical networks) in which the photonics industry and research community can productise their technologies to a point of market-readiness.

2. Business Need/ Justification

Currently there is no South African facility for the development of photonics prototypes. If universities or industry were to develop such capabilities, it would result in repeated infrastructure costs as well as a drain on manpower and resources. The PPF’s infrastructure, location and expertise make it the most viable option for industry to develop competitiveness through new products and variants.

3. Scope

3.1 Objectives

The overall objectives of the PPF are:

- To provide the necessary skills and facilities for the *productisation* of photonics-based technologies to produce products well-aligned to market-needs.
- To leverage private sector co-investment from PPF industry partners through either funding contributions or in-kind contributions.
- To develop expertise (amongst current and new PPF staff, students and interns) in the area of prototyping, product development and stakeholder engagement.
- To support and stimulate the growth of the South African photonics industry by producing new, valuable prototypes for either existing industries or for the formation of new, emerging entities (SMMEs).

3.2 Exclusions

The PPF will not engage in projects that are not related to photonics technologies. The PPF will not become a manufacturing facility that competes with industry. The PPF will not conduct work on projects whose TRL is lower than a TRL of 3.

3.3 High-Level Requirements

Sufficient funding and industry engagement/ participation needs to be secured in order for the above mentioned objectives to be satisfied.

3.4 Deliverables

The success of the PPF will be measured on the following criteria (i.e. expected to deliver in the following areas):

- The number of unique prototypes produced by the PPF and their respective conversion rate in the facility.
- The number of PPF clients and industry partners.
- The training of interns and students within the PPF and their corresponding uptake by industry and emerging entities (SMMEs).
- PPF projects are executed within their predefined time-frame and budget.

4. Constraints, Assumptions, Risks

4.1 Constraints

Currently the success of the PPF is constrained by the weakly established South African photonics community. The number of South African based photonics companies (possessing local content) is miniscule in comparison to the rest of the world. Well-established photonics companies have constrained R&D budgets and are import dominated. There are also limited photonics-based manufacturing capabilities present in the country.

4.2 Assumptions

The assumptions made in developing and establishing the PPF have consisted of the lucrative growth rate of the global photonics industry, as well as the South African photonics landscape. Another assumption is that we are assuming that funding will be secured for the following two years while the PPF is still in its establishment phase, before projects start generating revenue.

4.3 Risks

Risk	Mitigation
Low level of participation.	Seed projects are being implemented in the PPF to create stakeholder confidence and gain traction. Market engagement will identify potential projects and third party funds will be secured to facilitate access to the PPF.
No uptake of technology after exit from PPF.	Projects are evaluated on their commercial relevance and scientific merit. Prototype development will be done in an iterative process to achieve optimal alignment with the prototype and market need.
Intellectual property not adequately protected.	IP status will be clarified at the onset where ownership of existing and future IP will be determined.
Insufficient funding streams for sustainability.	The PPF will secure general funding to facilitate project access. Funding applications should be submitted well in advance.
PPF manpower skill set insufficient.	Specific tasks will be sub-contracted to external service providers as required. Training programmes will be designed to build capacity amongst PPF interns.
SHEQ risks not adequately addressed.	All PPF participants undergo laser safety training. The labs have secure access control and safety measures.
Loss of skilled expertise	A succession plan will be developed in the form of training interns.

5. Project Organisation

5.1 Roles and Responsibilities

Role	Responsibility
Business area manager	Formulate and execute the business development of the facility in identifying and sourcing suitable industry partners.
Programme administrator	Assist with the report writing and presentation as well as the awareness activities for the facility.
Engineer/ Scientist	Perform mechanical & electronic designs. Assembly of systems. Commissioning of the system in its operational & functional environment. Testing & characterisation of the system output & performance to formulate the specification of the prototype.
Technician	Perform mechanical & electronic designs. Procurement of custom commercial off-the-shelf components. Assembly of systems.
Intern	Assembly of systems. Commissioning of the system in its operational & functional environment. Testing & characterisation of the system output & performance to formulate the specification of the prototype.
Industrial designer (External)	Perform industrial designs. Commissioning of the system in its operational & functional environment.
Business Support (CSIR Licensing & Ventures, CSIR Entrepreneur in Residence, Technology Localisation Implementation Unit)	Development of a commercialisation plan for the technology.
Advisory Board	Provide final approval on projects and strategic inputs and insights.
Investment Committee	Provide recommendations on projects.